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Diagnosis of the *Lerista bipes* species-group (Lacertilia: Scincidae), with a description of a new species and an updated diagnosis of the genus

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Abstract

The *bipes* species-group of *Lerista* is diagnosed; its most significant feature is a reduction in the number of cervical vertebrae from eight to seven. A new species in the group is described as *L. praefrontalis;* it is unique in the group in having retained prefrontal scales and in having lost one phalange in the fourth toe of the pes. An updated key is provided for the *bipes* group. The genus *Lerista* is rediagnosed *vis-à-vis* the *Sphenomorphus* group of lygosomine skinks.

Introduction

The genus *Lerista* is a species-rich group of small to medium-sized sand-swimming, lygosomine skinks occurring in the arid and semi-arid areas of mainland Australia wherever there are sandy substrates. Forty-five species are known at present and many of these have only been described recently; presumably many more await discovery.

Within *Lerista,* there is a group of eight species that share a very distinctive morphology and are associated with areas of fine, loosely consolidated sand substrates – mainly dunes. The group has not been recognised before and the purpose of this paper is to diagnose this group and describe a new species in it. An existing, informal name, '*bipes* species-group', is used for the group, but it should be noted that its use here differs by being more restrictive than in previous usage (Storr 1972; Storr *et al.* 1981).

Lerista bipes species-group

Diagnosis

The *bipes* species-group differs from all other *Lerista (sensu* Greer 1967 and Storr 1972, 1976) in the following combination of derived *(vis-à-vis* other *Lerista)* character states: nasals slightly enlarged; frontoparietals fused to each other and to interparietal; preocular single; presuboculars absent; supraciliaries 0 + 2; primary temporal contacts parietal broadly.

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Snout region of skull constricted at premaxillary – maxillary suture; pre- and postfrontals meet above orbit.

Front limb reduced to basal nubbin of humerus, not visible externally; rear limb didactyl, phalanges reduced to 0.0.3.5.0 or less, metatarsals 1 and 2 absent; third distal tarsal fused to astragalus.

Venter lacks colour.

Presacral vertebrae $\geqslant 41$; postsacral vertebrae $\leqslant 43$; cervical vertebrae seven.

Sternal ribs two, from eighth and ninth vertebrae; mesosternum absent; complete inscriptional chevrons $\geqslant 8$.

The reduction of the cervical vertebrae from eight to seven is especially significant in identifying the *bipes* group as monophyletic because it is not known to occur elsewhere in the family except in the African scincine lineage *Melanoseps – Typhlacontias – Scolecoseps – Feylinia,* in the African lygosomine *Eumecia,* and in the Australian lygosomine *Anomalopus brevicollis.*

Remarks

The following seven described species of *Lerista* show this combination of character states or states derived from them: *bipes* (Fischer, 1882); *greeri* Storr, 1982; *griffini* Storr, 1982; *ips* Storr, 1980; *labialis* Storr, 1972; *simillima* Storr, 1984b and *vermicularis* Storr, 1982. For identification aids for these species see Storr (1984b) and Storr *et al.* (1981).

The group occurs throughout arid and semi-arid Australia in areas of fine, loosely consolidated sand. The group's centre of abundance is in north-western Australia.

The relationships of the *bipes* group as conceived here are unclear. Previously, members of this group have been allied with the species *connivens, humphriesi, nichollsi, onsloviana, praepedita* and *uniduo* (Storr, 1972, 1984a; Storr *et al.,* 1981). However, the derived character states recognised to date for this expanded group ('no fore-legs and never more than two toes; snout flat and very protrusive' – Storr *et al.* 1981) are neither extensive nor unusual and even an expanded comprehensive diagnosis such as that given above for the *bipes* group would only consist of modifications common in many sand-swimming lineages; there are no unique or unusual character states such as the reduced number of cervical vertebrae which diagnoses the *bipes* group *(sensu stricto).* This extended concept of the *bipes* group, therefore, may well represent a polyphyletic assemblage of sand-swimmers.

Among the species previously associated with the *bipes* group *(sensu stricto),* four share an unusual character which may be indicative of their close relationship: *connivens, nichollsi, onsloviana* and *uniduo* all have very loosely attached scales. These 'tear-away scales', which may be a predator-escape device, occur otherwise in skinks only in a few *Ctenotus.* Recently Storr (1984a) recognised these *Lerista* species as the *nichollsi* group but the diagnosis comprised only primitive character states (possession of prefrontals and a forelimb groove).

Perhaps tear-away scales are more indicative of the monophyly of the *nichollsi* complex. The wider relationships of this group, like those of the *bipes* group, remain to be discovered.

Lerista praefrontalis sp. nov.

Figures 1 and 2

Holotype

Western Australian Museum R 80580: King Hall Island, WA; 16°05′S, 123°25′E; Fisheries and Wildlife Department expedition; 27 June 1982; 'in litter among sand at base of cliff'.

Diagnosis

Differs from all other members of the *bipes* species group *(sensu stricto)* in each of the following characters: prefrontals distinct, and phalanges of fourth toe of pes four instead of five.

Description

Snout depressed and projecting, lower jaw countersunk; rostral scale crescentic anteriorly and trilobed posteriorly with medial lobe attaining level of nostril and narrowing contacting frontonasal, and two lateral lobes almost reaching level of posterior edge of nasal; supranasals absent; frontonasal trapezoidal, slightly wider than long, smoothly rounded on posterior lobe; prefrontals present, separated, each divided obliquely; frontal longer than wide, broadly and smoothly rounded posteriorly; supraoculars three, first two on each side contacting frontal, first one reaching orbit; frontoparietals and interparietal fused into a single scale with a clear area just posterior of centre through which parietal eye is evident; parietals meeting behind fused frontoparietal-interparietal; pairs of transversely enlarged nuchals two.

Nasal shaped like bishop's hat, with medial apex tilted forward and nostril just behind anterior suture at level of 'hat's' bulge; loreals two, posterior fused to single preocular; supraciliaries two, first projecting medially between second and third supraoculars; suboculars represented by only two postsuboculars; postocular single; lower eyelid movable with clear window; primary temporal single, large, in broad contact with parietal; secondary temporals two, upper much larger than and overlapped by lower; supralabials five, third subocular; postsupralabial single; external ear opening very small.

Mental with little dorsal upturning; infralabials five; postmental single, in contact with first two infralabials on each side; enlarged pairs of chin scales three, members of first two pairs separated by one scale row, members of third pair by three scale rows.

Longitudinal scale rows at midbody 20; paravertebral scales 99; subdigital lamellae of largest (fourth primitively) toe 8-9.

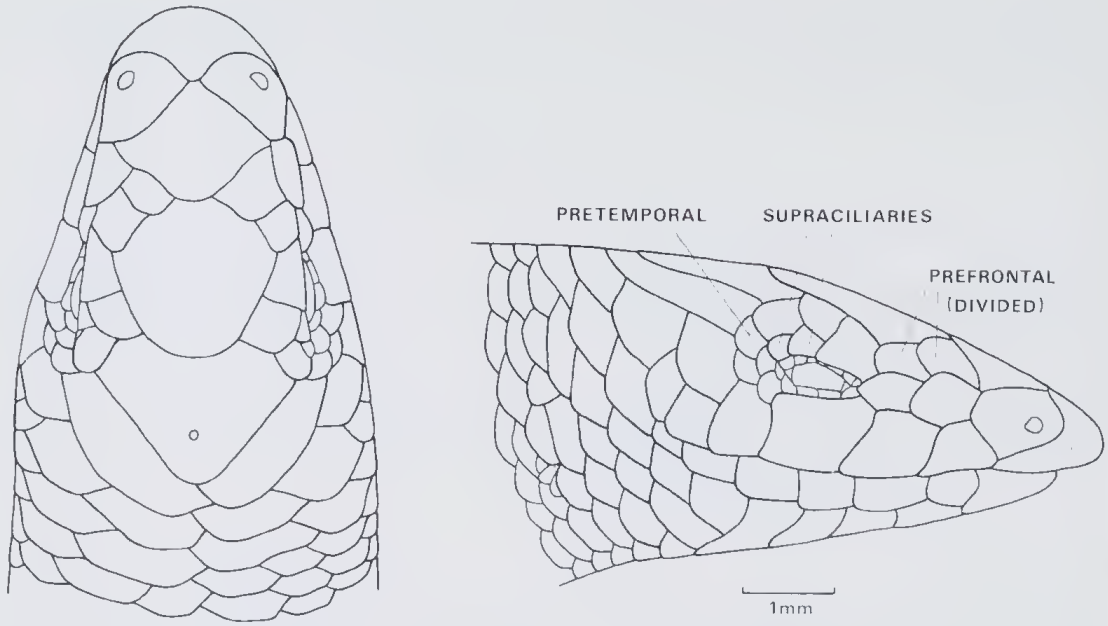

Figure 1 Head of the holotype of *Lerista praefrontalis* (WAM R 80580).

Figure 2 Photograph of the holotype of *Lerista praefrontalis* (WAM R 80580).

Snout-vent length 67 mm; no external trace of front limbs; rear limbs didactyl, 11.9 per cent of SVL; tail 58 mm, 16 mm of which is regenerated.

Colour in preservative sandy beige above with a dark brown lateral stripe extending from canthus to base of tail and a row of dark brown dashes running through centre of each paravertebral row from neck on to base of tail; opalescent below dark lateral stripe.

Presacral vertebrae 45; sternal ribs two; complete inscriptional chevrons 10; phalangeal formula of pes: 0.0.3.4.0/0.0.2.4.0 (i.e. bilaterally asymmetric).

Distribution

Only known from a single specimen from King Hall Island in the Kimberley of Western Australia.

Figure 3 Map showing the distribution of *Lerista praefrontalis* (dark triangle).

Etymology

The species name derives from the unique retention of the prefrontals within the *bipes* species-group.

Key to the species of the *Lerista bipes* species-group

1 Prefrontals present, distinct ..... *praefrontalis*
Prefrontals fused to loreal or absent 2

2 Supralabials six, fourth subocular 3
Supralabials five, third subocular 5

3 Supraoculars three 4
Supraoculars two 7

4 Supraciliaries present ..... *greeri*
Supraciliaries absent ..... *ips*[1]

5 Preocular distinct ..... *bipes*
Preocular fused to posterior loreal 6

6 Supraoculars three, first two contact frontal; supraciliaries present; lower secondary temporal present ..... *griffini*
Supraoculars two, first only contacts frontal; supraciliaries absent; lower secondary temporal absent ..... *vermicularis*

7 Two supraoculars contact frontal ..... *simillima*
One supraocular contacts frontal ..... *labialis*

Diagnosis of the genus *Lerista*

Recent morphological surveys of the species of *Lerista* using x-rays and cleared and double-stained specimens, plus a better understanding of character state polarities in skinks in general, permits a more comprehensive diagnosis of *Lerista* than available previously (Greer 1967, Storr 1972 and 1976).

The genus *Lerista* is a member of the *Sphenomorphus* group (*sensu* Greer 1979) of lygosomine skinks (*sensu* Greer 1986) but differs from all other members of that group in the following combination of derived character states: prefrontals separated; lower eyelid with clear window; lower secondary temporal overlaps upper; external ear opening small, without projections.

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[1] I interpret Storr's (1980) single supraciliary in *ips* as the third supraocular; compare this scale in *ips* with the scale of similar size and position in *labialis* which Storr (1972) calls a supraocular.

Premaxillary teeth ⩽ 7; postorbital absent; vomers fused; pterygoid teeth absent; palatal rami of pterygoids squared off, in medial contact; process from ectopterygoids excluding palatal rami of pterygoid from infraorbital vacuity.

Presacral vertebrae ⩾ 31.

Visceral fat bodies absent; parietal peritoneum lacking pigment.

For a list of included species see Cogger *et al.* (1983) and Storr (1984a-b, 1985).

Acknowledgements

G.M. Storr originally recognised *Lerista praefrontalis* as new and at my request generously allowed me to describe it and hence use the description to publish my diagnosis of both the *bipes* species-group and the genus *Lerista;* P. Kendrick and G.M. Storr critically read the manuscript, and D. Kent did the artwork and typing.

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